



EHR ADVISORY COMMITTEE MEETING May 21, 2020

Karen Marrongelle

Assistant Director
Education and Human Resources



EHR Advisory Committee Chair



National Science Foundation



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Marilyn E. Strutchens

EHR Advisory Committee Chair

Emily R. and Gerald S. Leischuck Endowed Professor and
Mildred Cheshire Fraley Distinguished Professor

Auburn University



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EHR

DIRECTORATE FOR
EDUCATION & HUMAN RESOURCES



National Science Foundation

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IN LOVING MEMORY OF

Dr. Karen King

July 6, 1971- December 24, 2019



PLEASE JOIN US FOR A
MEMORIAL SERVICE
HONORING

Dr. Karen King

MONDAY, FEBRUARY 3, 2020

11:00AM

CONFERENCE ROOM 3430

NATIONAL SCIENCE FOUNDATION

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NSB-2020-9
February 5, 2020

RESOLUTION

NATIONAL SCIENCE BOARD

IN MEMORY OF DR. KAREN DENISE KING, PH.D.

Whereas the National Science Board lost a valued Executive Secretary on December 24, 2019, with the death of Dr. Karen D. King:

Whereas Dr. King provided valuable advice and assistance to the National Science Board's Committee on Education and Human Resources, Committee on Strategy and Vision 2030 Task Force:

Whereas Dr. King had a distinguished career furthering mathematics education and a tireless passion for increasing participation of African Americans, particularly young women, in STEM fields; and

Whereas Dr. King's dedication, energy and insight enriched those fortunate to know and work with her, therefore, be it,

Resolved, that the National Science Board honors the memory of Karen King and recognizes with great admiration and appreciation her contributions to the National Science Board and the National Science Foundation.

A handwritten signature in black ink, reading 'Diane L. Souvaine'.

Diane L. Souvaine
Chair

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*Thank
You*

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NSF CAREER Awards

NSF 20-084

Dear Colleague Letter: CAREER Proposals Submitted to the Directorate for Education and Human Resources (EHR)

May 18, 2020

Dear Colleagues:

The Directorate for Education and Human Resources (EHR) encourages eligible members of the STEM education research community to submit proposals to the National Science Foundation's CAREER program. The purpose of this letter is twofold: (a) to highlight, clarify, and draw attention to important information included in Program Solicitation [NSF 20-525](#) as it relates to CAREER proposals submitted to divisions and programs within EHR; and (b) to list the divisions and programs within EHR that intend to review and fund CAREER proposals.

EHR supports excellence in U.S. science, technology, engineering, and mathematics (STEM) education at all levels and in all settings to develop a well-informed citizenry and a diverse and well-prepared workforce of scientists, technicians, engineers, mathematicians, and STEM educators. EHR invests strategically in research to understand STEM learning and education. Supporting early-career investigators is a crucial element of this EHR investment across EHR's programs.

The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of early-career faculty (and eligible investigators at non-degree-granting organizations, such as museums, observatories, or research labs) who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization. Activities pursued should build a firm foundation for a lifetime of leadership in integrating education and research. NSF encourages submission of CAREER proposals from eligible investigators at all CAREER-eligible organizations and especially encourages women, members of underrepresented minority groups, and persons with disabilities to apply.

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Session 1:

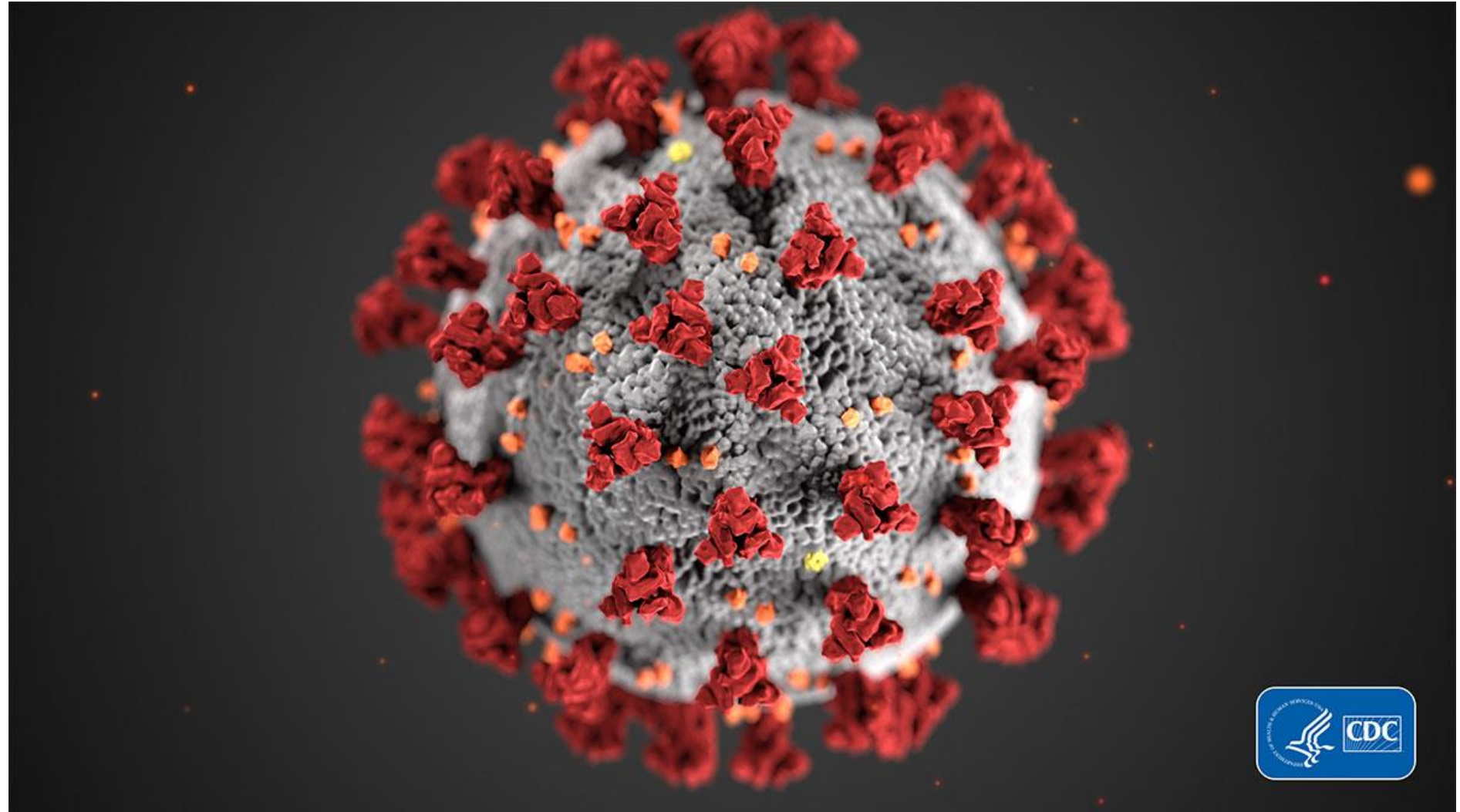
NSF RESPONSE to COVID-19

Moderator: Karen Marrongelle,
Assistant Director, EHR

National Science Foundation



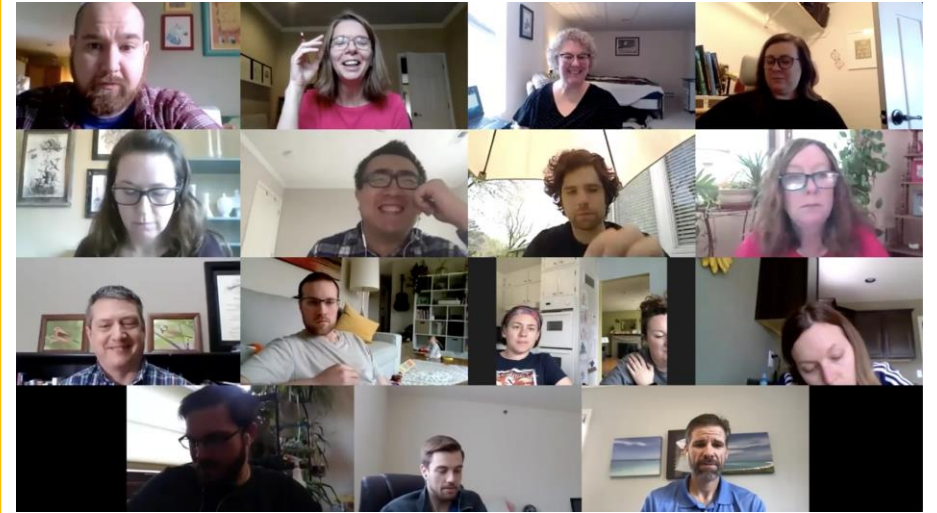
NSF RESPONSE to COVID-19



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CARES Act NSF RAPIDS



Science teachers
working with the
University of
Missouri and the
University of North
Carolina at Chapel
Hill to create
COVID-19 lessons
participate in a
virtual professional
development
workshop in March.



Professor of
Science Education
Pat Friedrichsen,
Univ of Missouri



NSF Blog Posts



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Discussion

How has COVID-19 impacted your respective communities?

What impacts on STEM education most concern you?

What can EHR do/How best can EHR address these issues?

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Session 2: Committee of Visitors (COV)

Moderator: Corby Hovis, EHR COV Coordinator and Program Director

Introduction: Evan Heit, Division Director, Division of Research on Learning in Formal and Informal Settings, EHR

Report from the COV for the Division of Research on Learning: *Okhee Lee*, Professor, Steinhardt School of Culture, Education, and Human Development, New York University; *Darryl Williams*, Senior Vice President of Science and Education, The Franklin Institute



Committee of Visitors for the
Division of Research on Learning (DRL)

COV Meeting Dates: October 17–18, 2019

**Briefing on the COV's Findings for the
EHR Advisory Committee**

Okhee Lee, New York University
Darryl Williams, The Franklin Institute

Co-Chairs of the COV

May 21, 2020

Members of the COV

Okhee Lee
Darryl Williams

New York University
The Franklin Institute

Angela Calabrese Barton
Marta Civil
James Dorward
Barbara Means
Hari Narayanan
Ross Nehm
Lance Pérez
Julie Sarama
Guillermo Solano-Flores

University of Michigan
University of Arizona
Utah State University
Digital Promise
Auburn University
Stony Brook University
University of Nebraska – Lincoln
University of Denver
Stanford University

DRL COV FINDINGS

Merit Review Process:

- ▶ The Merit Review Process is appropriate, mostly involving panel reviews.

COV Recommendations:

- ▶ The “five review elements” direction is unclear and seems to be interpreted in different ways.
- ▶ The COV requests clarification of why Broadening Participation (BP) is only included in AISL and ITEST. The COV recommends continued efforts on defining BP and preparing reviewers for BP criteria.
- ▶ The COV recommends clarity on the “Transformational” or “Innovative” criteria, which may impact how reviewers review and rate proposals.
- ▶ The COV recommends the Division consider conducting a study of the value added by a fourth reviewer.

DRL COV FINDINGS

Selection of Reviewers:

- ▶ In general, the selection of reviewers appears appropriate.

COV Recommendations:

- ▶ The data about reviewers is not complete enough to provide an in-depth analysis:
 - It is unclear whether the categories used for reviewer expertise are aligned with the types of expertise needed for a given proposal or program.
 - It is difficult to assess the experience of the reviewers, specifically as reviewers as opposed to their broader NSF experience.
- ▶ The COV encourages the Division to continue its efforts for improved data collection about reviewer expertise and qualifications.
- ▶ The Division should identify reviewers who have experience in transformative work and can evaluate transformative proposals.

DRL COV FINDINGS

Management of the Program:

- ▶ In general, the overall program management plans for the programs under review have been improved.

COV Recommendations:

- ▶ The COV finds it difficult to determine how portfolio management occurs, how it is evaluated, and how continuous improvement is addressed.
- ▶ The COV recommends the Division consider ways to make more effective use of project evaluation reports in its efforts towards continuous improvement.
- ▶ The COV encourages the Division to devote additional efforts to documenting the rationale for portfolio development and evaluation.
- ▶ The COV recommends a Division-wide logic model that all programs are mapped to for cohesive scope and focus.

DRL COV FINDINGS

Portfolio of Awards:

- ▶ The COV believes that the portfolio of awards is appropriate and that the solicitations generally address disciplinary and sub-disciplinary priorities.

COV Recommendations:

- ▶ The COV encourages the Division to continue its efforts to develop additional research capacity across a wider range of institutions, a more diverse set of PIs, and a more intersectional analysis of projects.
- ▶ The COV recommends the Division provide more clarity regarding the criteria for designating projects as innovative or transformative.
- ▶ The data analysis system needs to reflect the multiple disciplines highlighted in the NSF 10 Big Ideas.

DRL COV FINDINGS

Other:

- ▶ The COV notes from the Strategic Planning 2016 document that DRL is cognizant of aligning itself with NSF's 10 Big Ideas. The COV recommends that this effort continue, especially along the lines of finding alignment with ideas, besides the three that are explicitly mentioned in this document (i.e., INCLUDES, harnessing the data revolution, and future of work at the human-technology frontier).
- ▶ The COV notes that there does not appear to be a clear assessment of how the Dear Colleague Letters impact the overall DRL portfolio.

Questions & Discussion



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Session 3: STEM Education of the Future Subcommittee of the EHR Advisory Committee

Moderator and Presentation:

Robin Wright, Division Director, Division of Undergraduate
Education, EHR

Margaret Honey, New York Hall of Science (NYSCI)
President and CEO, AC Subcommittee Chair

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EHR AC Subcommittee on STEM Education of the Future

Subcommittee Members:

- Dr. Margaret Honey (Chair)
- Dr. Bruce Alberts
- Dr. Hyman Bass
- Dr. Carlos Castillo
- Dr. Okhee Lee
- Dr. Francisco Rodriguez (Ex-Officio Member)
- Dr. Marilyn M. Strutchens
- Dr. Laurel Vermillion
- Dr. Robin Wright (Division Director, Undergraduate Education)

Executive Secretary: Dr. Alexandra Medina-Borja (EHR/DUE)

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EHR AC Subcommittee on STEM Education of the Future

**Fall 2017 EHR
AC Meeting:**

Subcommittee
formed

March 2018:

Charge
delivered

2018-2019:

Eight meetings

**Fall 2019 EHR
AC Meeting:**

Draft Report

**Spring 2020
EHR AC
Meeting:**

Final report

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EHR AC Subcommittee on STEM Education of the Future

Dr. Jim Spohrer

IBM's Director, Cognitive OpenTech: *The future of technology and impact on Education* (April 25, 2018)

EHR/NSF Program Officers

INCLUDES, CYBERLEARNING, ATE, IGE, FW-HTF, IUUSE, CS-FOR-ALL (May 31, 2018)

Dr. Christine Ortiz

MIT/Station 1: *The Future of the Research University: Promise and Peril* (May 31, 2018)

STEM Education Innovators (September 10-11, 2019)

- Dr. Larry Rosenstock, High-Tech High
- Dr. Mark Somerville, Olin College of Engineering
- Dr. Josh Fost - Minerva Schools
- Dr. Arthur Heinrichler – Worcester Polytechnic Institute
- Dr. Ann Mckenna - Arizona State University

Panel: Designing Higher Education Systems Founded on Access and Equity (October 16, 2019)

- Dr. Maria Klawe, Harvey Mudd College
- Dr. Claude M. Steele, Stanford U
- Mr. Antonio Perez, Engineering Student, Olin College of Engineering



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Vision Statement for STEM Education of the Future

All citizens can contribute to our nation's progress and vibrancy.

To be prepared for the STEM careers of the future, all learners must have an equitable opportunity to acquire foundational STEM knowledge. The STEM Education of the Future brings our advanced understanding of how people learn together with modern technology to create more personalized learning experiences, to inspire learning, and to foster creativity from an early age. It will unleash and harness the curiosity of young people across the United States, cultivating a culture of innovation and inquiry, and ensuring our nation remains the global leader in science and technology discovery and competitiveness.

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A Vision for STEM Education of the Future: Priorities

All learners at all stages of their educational pathways must have access to and opportunities to choose STEM careers and contribute to the innovation economy.

We must build an ethical workforce with future-proof skills.

We must ensure that the appropriate technological innovations make it into the classroom, whether face-to-face or not, guided by educators who understand how modern technology can affect learning, and how to use technology to enhance context and enrich learning experiences for students.

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A Vision for STEM Education of the Future

Learning environments are student-centered, project-based, and personalized.

Equity and inclusion are foundational principles.

Technology holds promise for creating equitable learning environments, but it also alters the skills we need in the future, and changes what and how we teach.

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SOCIETAL ISSUES & CHANGING DEMOGRAPHICS
GLOBAL PROBLEMS & THE CHANGING NATURE OF WORKS & JOBS

21ST CENTURY SKILLS

*e.g., creativity; collaboration;
working across disciplinary
boundaries*

SYNTHESIS

*solving problems with cross
disciplinary knowledge*

SELF-ACTUALIZATION

*reaching toward one's
fullest potential*

STUDENT LEARNING OUTCOMES



LEARNER-CENTERED



PROJECT-BASED



PERSONALIZED

TECHNOLOGY

EQUITY & INCLUSION

Who is excluded by my intervention, curriculum, materials,
evaluation, or classroom or institutional environment?



LEARNING ACROSS LIFESPANS & TRADITIONS

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GLOBAL PROBLEMS & THE CHANGING NATURE OF WORKS & JOBS

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LEARNING ACROSS LIFESPANS & TRADITIONS

What does EHR
need to **do now**
to support this
vision?

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Closing Remarks

Karen Marrongelle
Assistant Director, EHR

Marilyn Strutchens
EHR Advisory Committee Chair